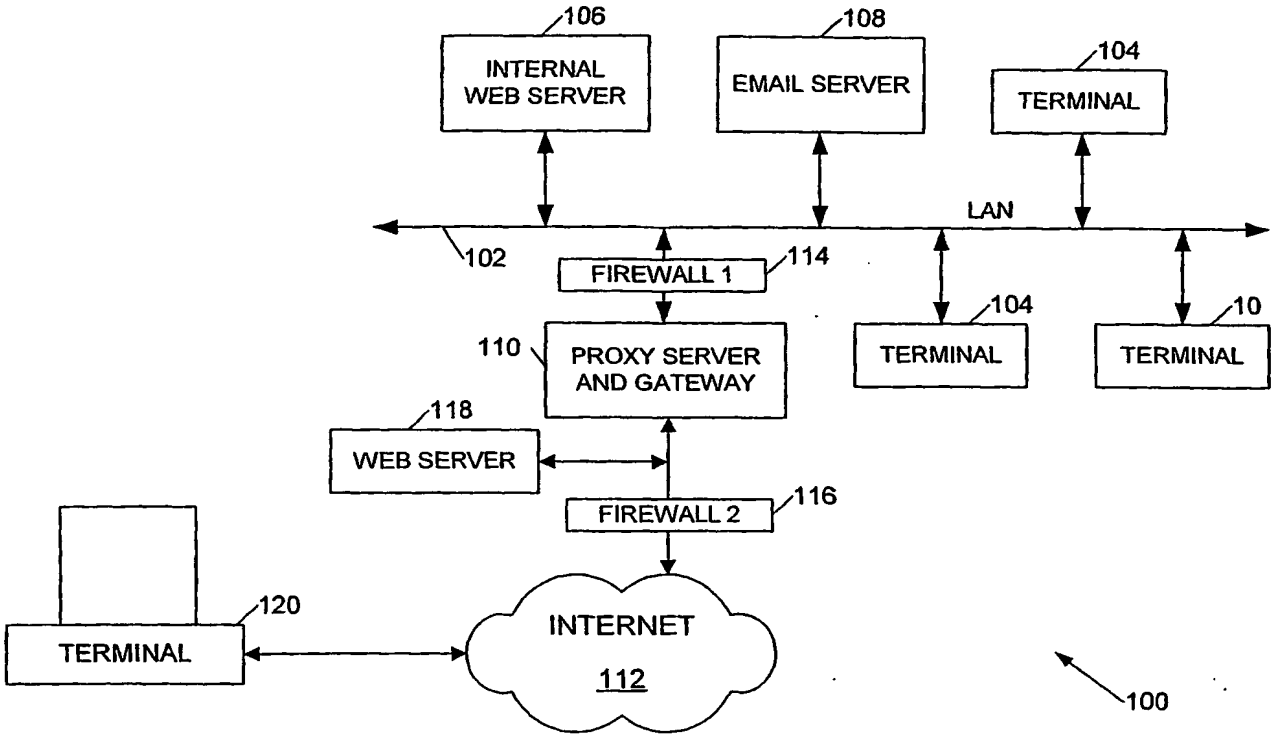
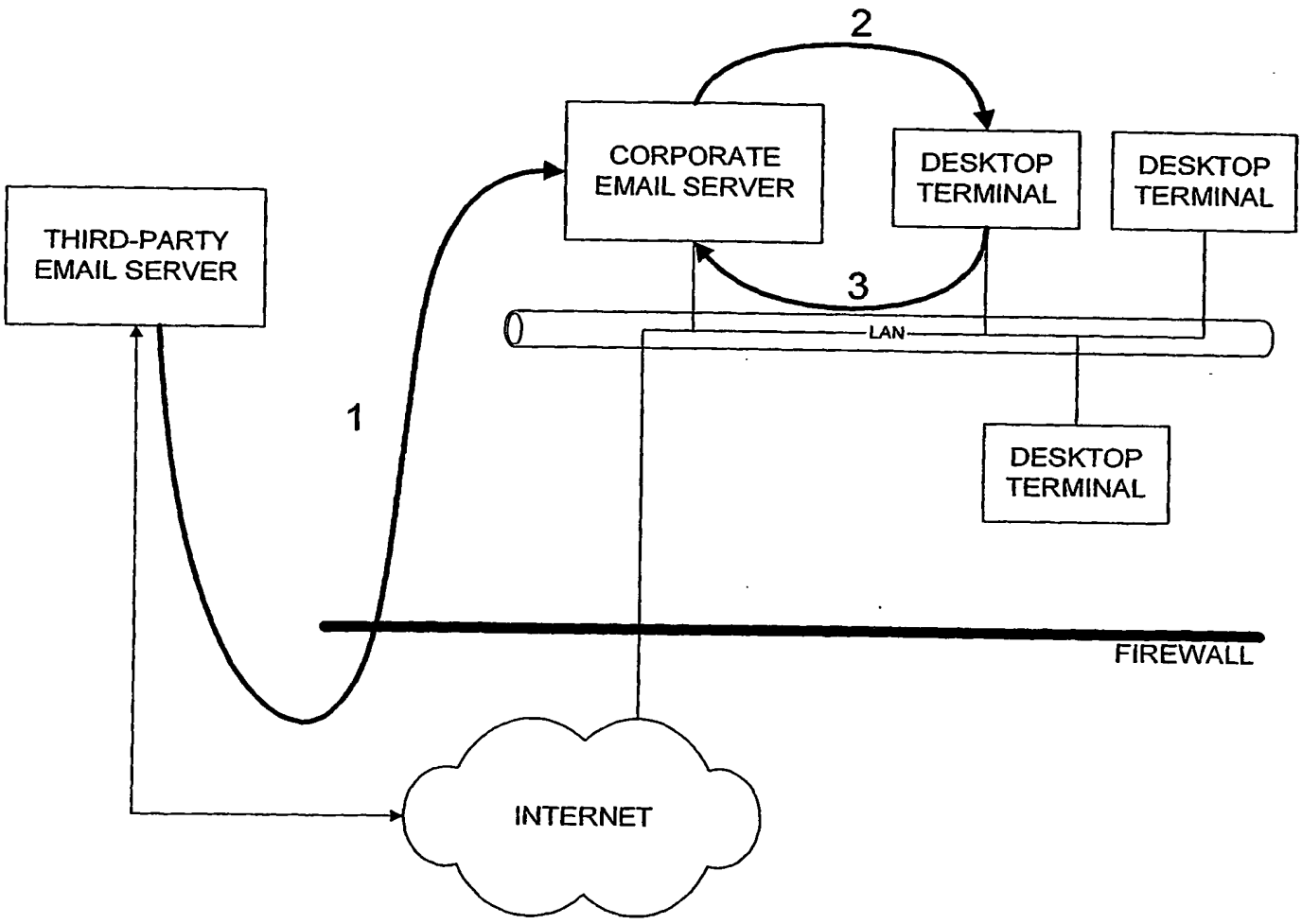


Figure 1a
(PRIOR ART)

10/534674
PCT/GB2003/004927
Rec'd PCT/PTO 12 MAY 2005



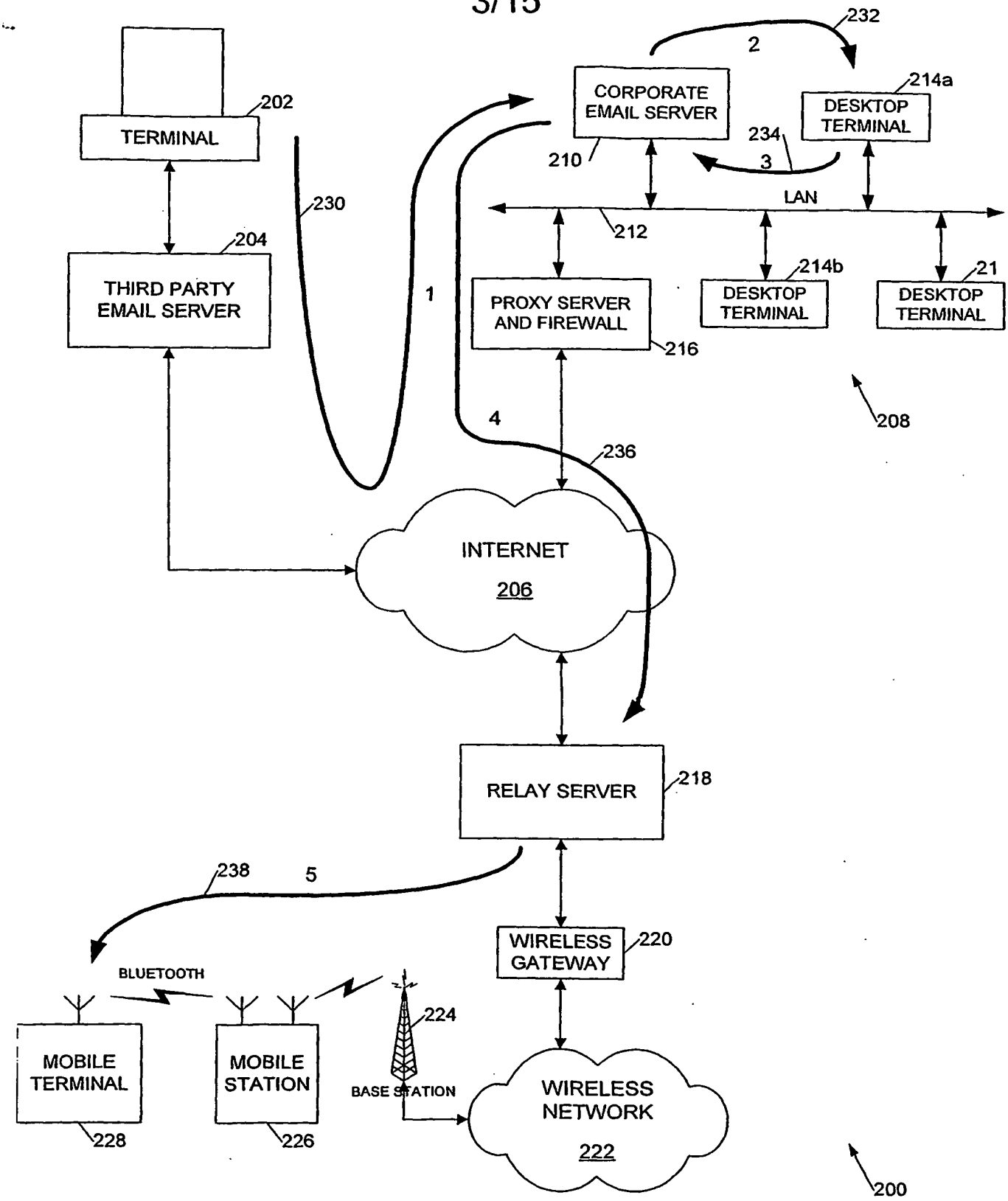

TERMINAL
202
THIRD PARTY EMAIL SERVER
204
230
1
CORPORATE EMAIL SERVER
210
232
2
DESKTOP TERMINAL
214a
234
3
LAN
212
PROXY SERVER AND FIREWALL
216
DESKTOP TERMINAL
214b
DESKTOP TERMINAL
21
208
4
236
INTERNET
206
RELAY SERVER
218
238
5
WIRELESS GATEWAY
220
BLUETOOTH
MOBILE TERMINAL
228
MOBILE STATION
226
224
BASE STATION
WIRELESS NETWORK
222
200

Figure 2a

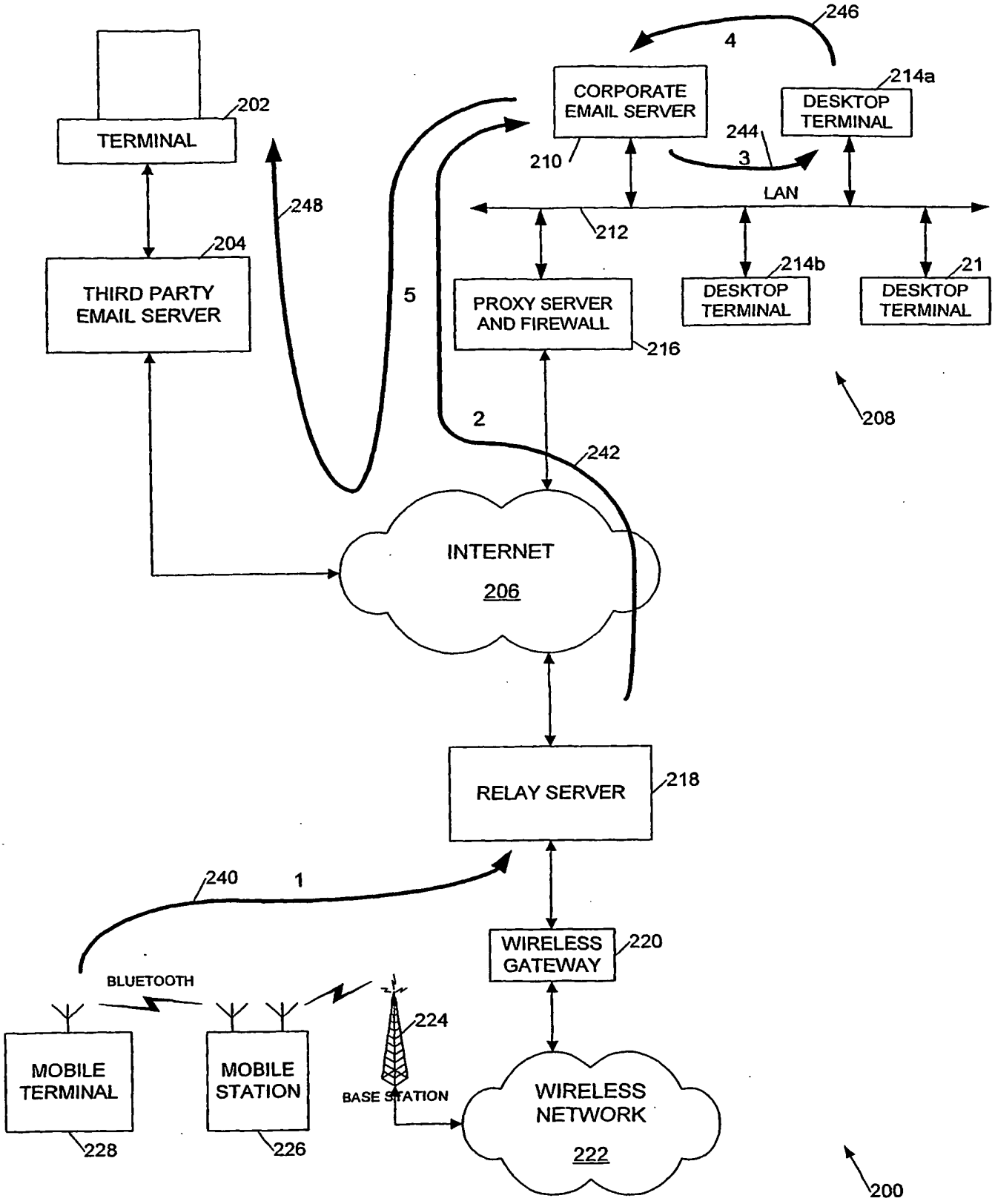

246
4
CORPORATE EMAIL SERVER
214a
DESKTOP TERMINAL
244
3
210
LAN
212
TERMINAL
202
248
204
THIRD PARTY EMAIL SERVER
5
PROXY SERVER AND FIREWALL
216
214b
DESKTOP TERMINAL
21
DESKTOP TERMINAL
208
2
242
INTERNET
206
RELAY SERVER
218
240
1
WIRELESS GATEWAY
220
BLUETOOTH
224
MOBILE TERMINAL
228
MOBILE STATION
226
BASE STATION
WIRELESS NETWORK
222
200

Figure 2b

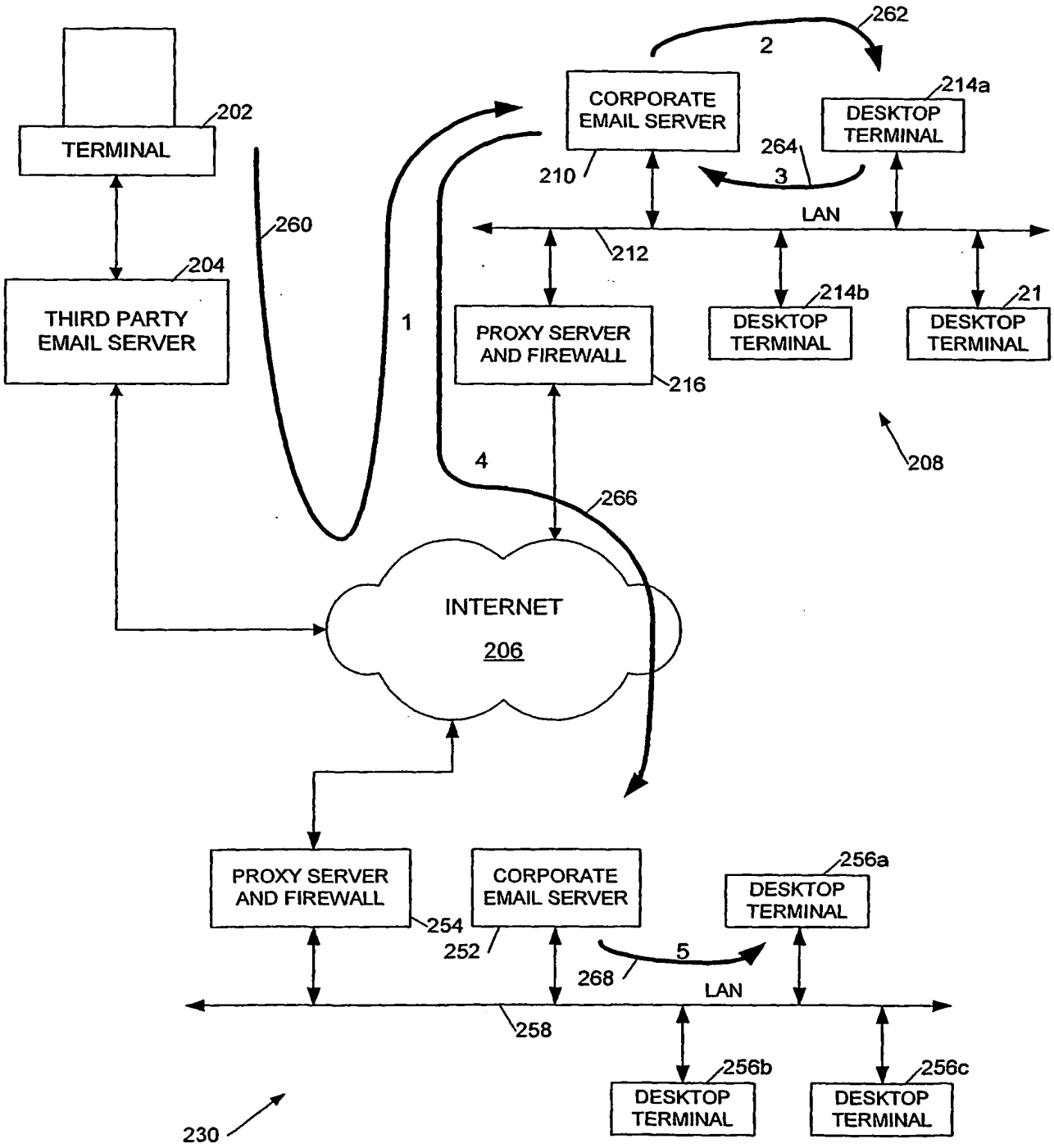

262
2
CORPORATE EMAIL SERVER
214a
DESKTOP TERMINAL
202
TERMINAL
264
3
210
LAN
260
212
204
THIRD PARTY EMAIL SERVER
1
PROXY SERVER AND FIREWALL
214b
DESKTOP TERMINAL
21
DESKTOP TERMINAL
216
208
4
266
INTERNET
206
PROXY SERVER AND FIREWALL
254
CORPORATE EMAIL SERVER
256a
DESKTOP TERMINAL
252
5
268
LAN
258
256b
DESKTOP TERMINAL
256c
DESKTOP TERMINAL
230

Figure 2c

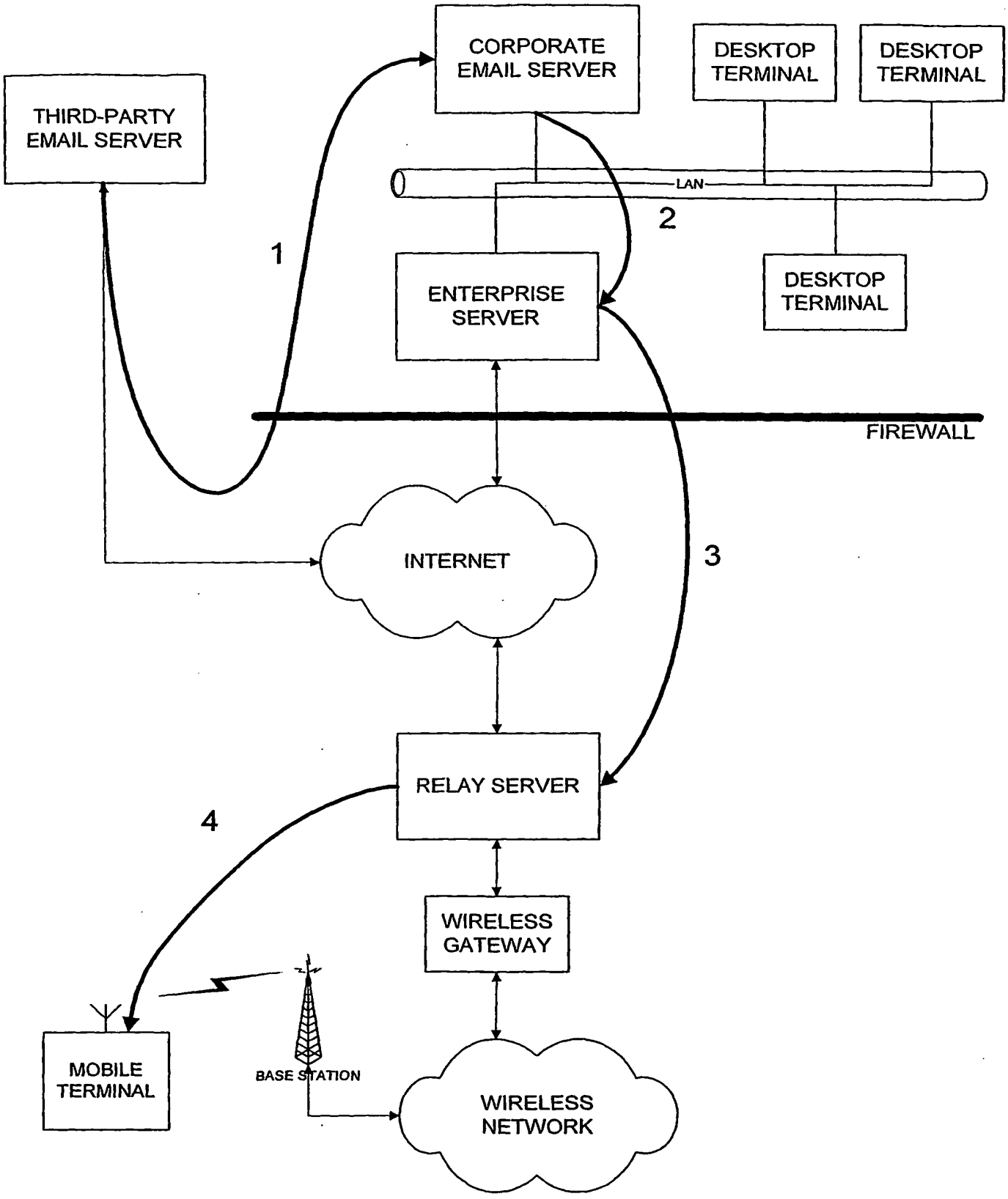

CORPORATE EMAIL SERVER
DESKTOP TERMINAL
DESKTOP TERMINAL
THIRD-PARTY EMAIL SERVER
LAN
2
1
ENTERPRISE SERVER
DESKTOP TERMINAL
FIREWALL
INTERNET
3
RELAY SERVER
4
WIRELESS GATEWAY
MOBILE TERMINAL
BASE STATION
WIRELESS NETWORK

Figure 2d

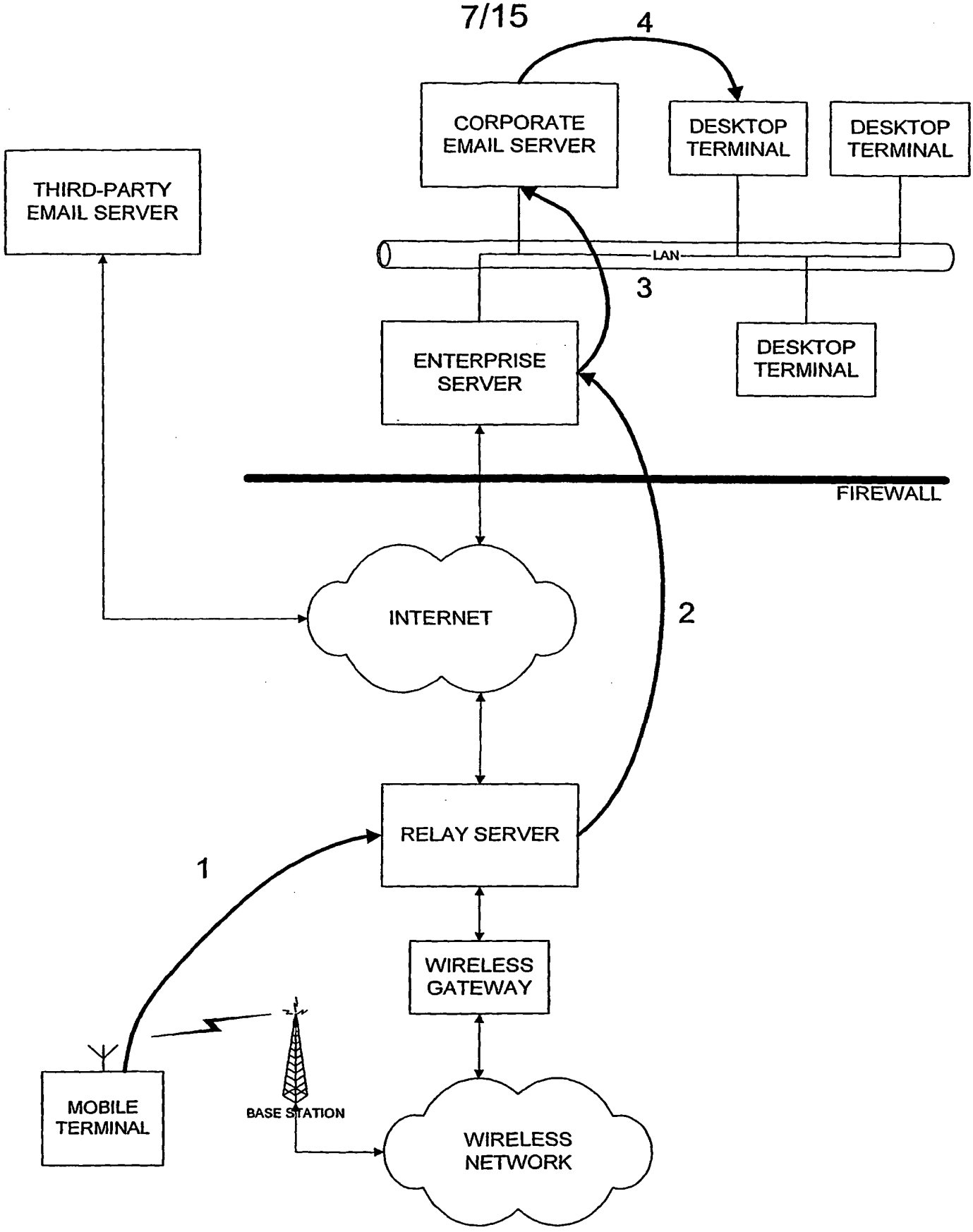

4
CORPORATE EMAIL SERVER
DESKTOP TERMINAL
DESKTOP TERMINAL
THIRD-PARTY EMAIL SERVER
LAN
3
ENTERPRISE SERVER
DESKTOP TERMINAL
FIREWALL
INTERNET
2
RELAY SERVER
1
WIRELESS GATEWAY
MOBILE TERMINAL
BASE STATION
WIRELESS NETWORK

Figure 2e

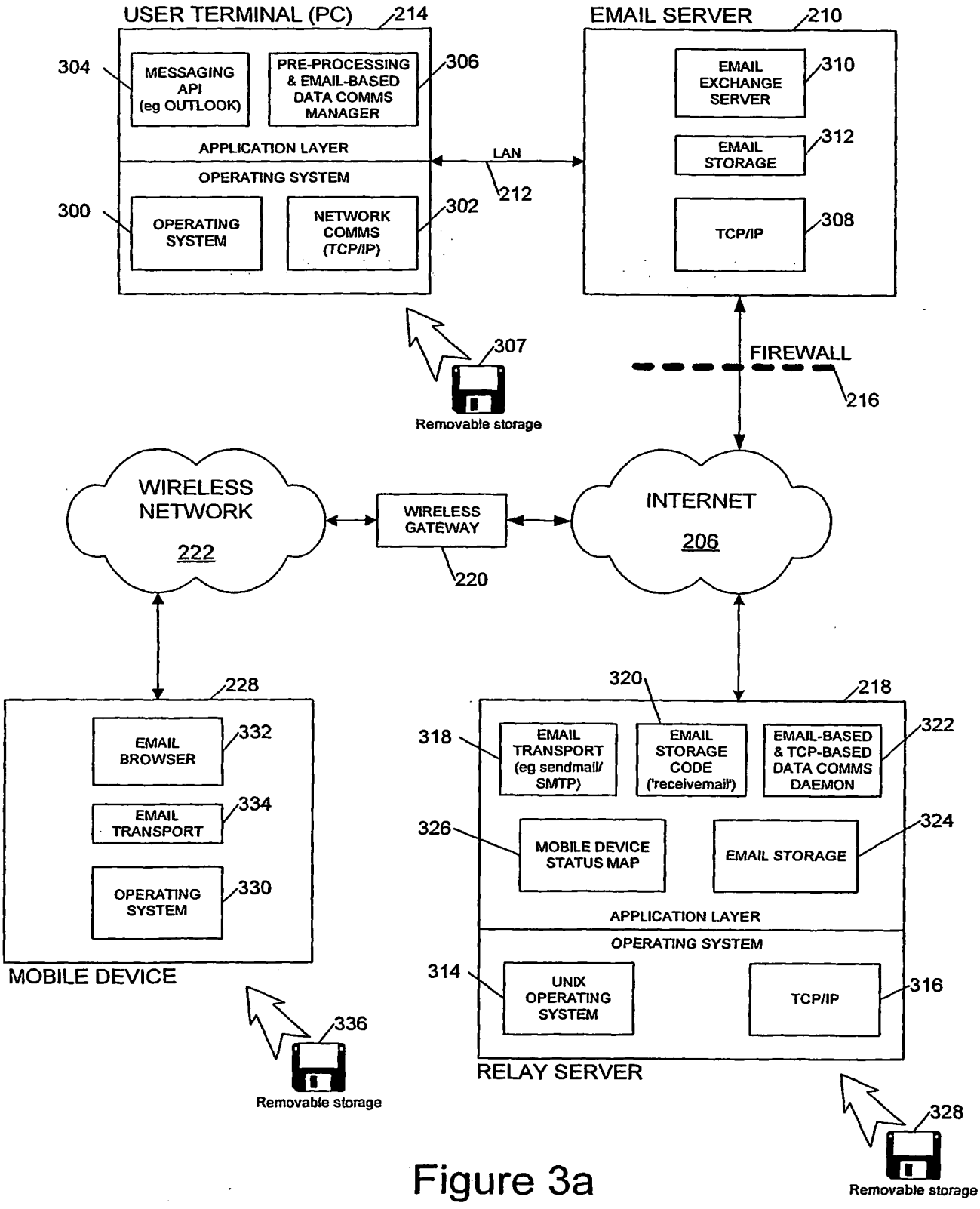

USER TERMINAL (PC)
214
304
MESSAGING API (eg OUTLOOK)
PRE-PROCESSING & EMAIL-BASED DATA COMMS MANAGER
306
APPLICATION LAYER
OPERATING SYSTEM
300
OPERATING SYSTEM
NETWORK COMMS (TCP/IP)
302
LAN
212
EMAIL SERVER
210
EMAIL EXCHANGE SERVER
310
EMAIL STORAGE
312
TCP/IP
308
307
Removable storage
FIREWALL
216
WIRELESS NETWORK
222
WIRELESS GATEWAY
220
INTERNET
206
228
EMAIL BROWSER
332
EMAIL TRANSPORT
334
OPERATING SYSTEM
330
MOBILE DEVICE
336
Removable storage
320
218
318
EMAIL TRANSPORT (eg sendmail/ SMTP)
EMAIL STORAGE CODE ('receivemail')
EMAIL-BASED & TCP-BASED DATA COMMS DAEMON
322
326
MOBILE DEVICE STATUS MAP
EMAIL STORAGE
324
APPLICATION LAYER
OPERATING SYSTEM
314
UNIX OPERATING SYSTEM
TCP/IP
316
RELAY SERVER
328
Removable storage

Figure 3a

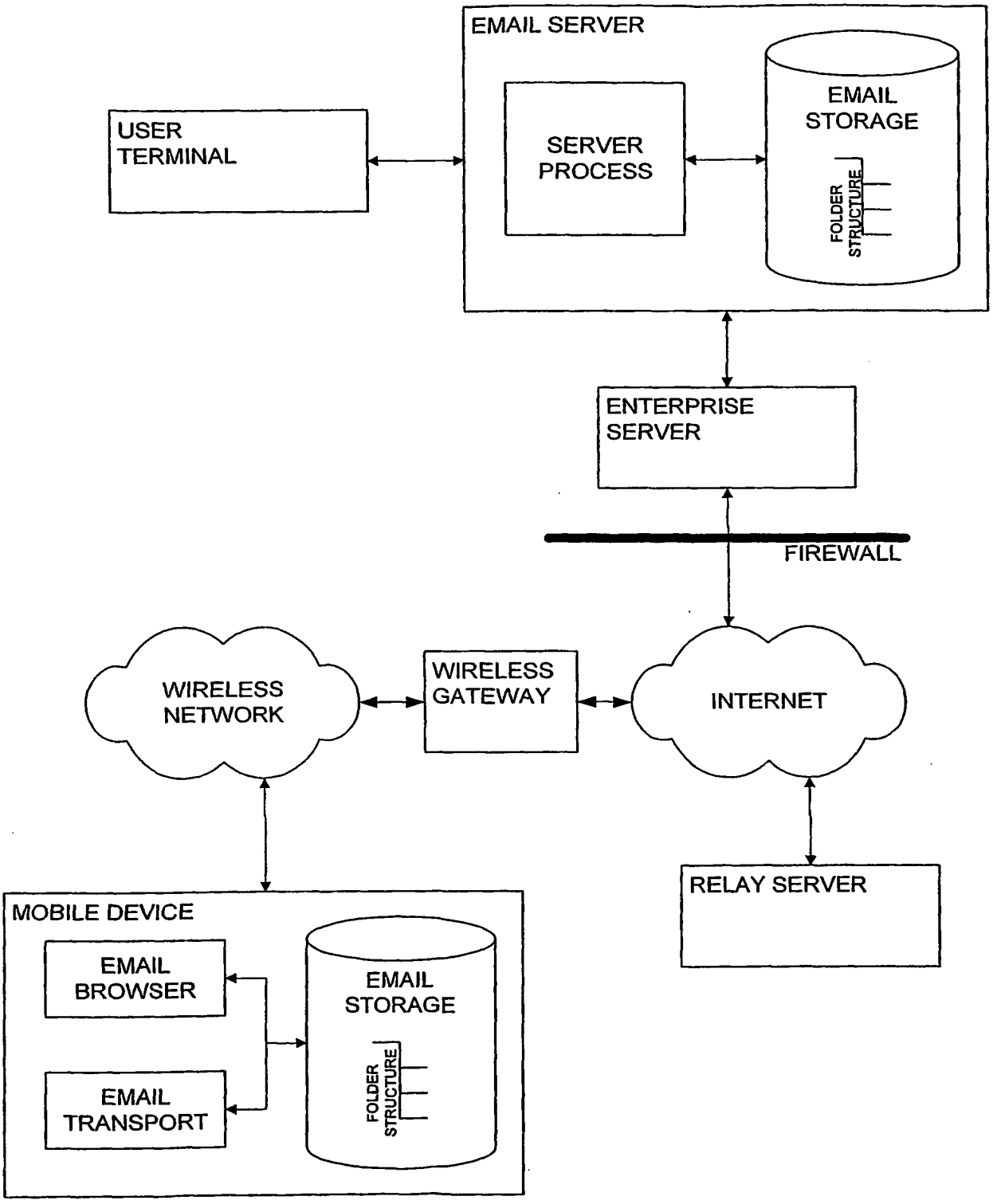

EMAIL SERVER
USER TERMINAL
SERVER PROCESS
EMAIL STORAGE
FOLDER STRUCTURE
ENTERPRISE SERVER
FIREWALL
WIRELESS NETWORK
WIRELESS GATEWAY
INTERNET
RELAY SERVER
MOBILE DEVICE
EMAIL BROWSER
EMAIL TRANSPORT
EMAIL STORAGE
FOLDER STRUCTURE

Figure 3b

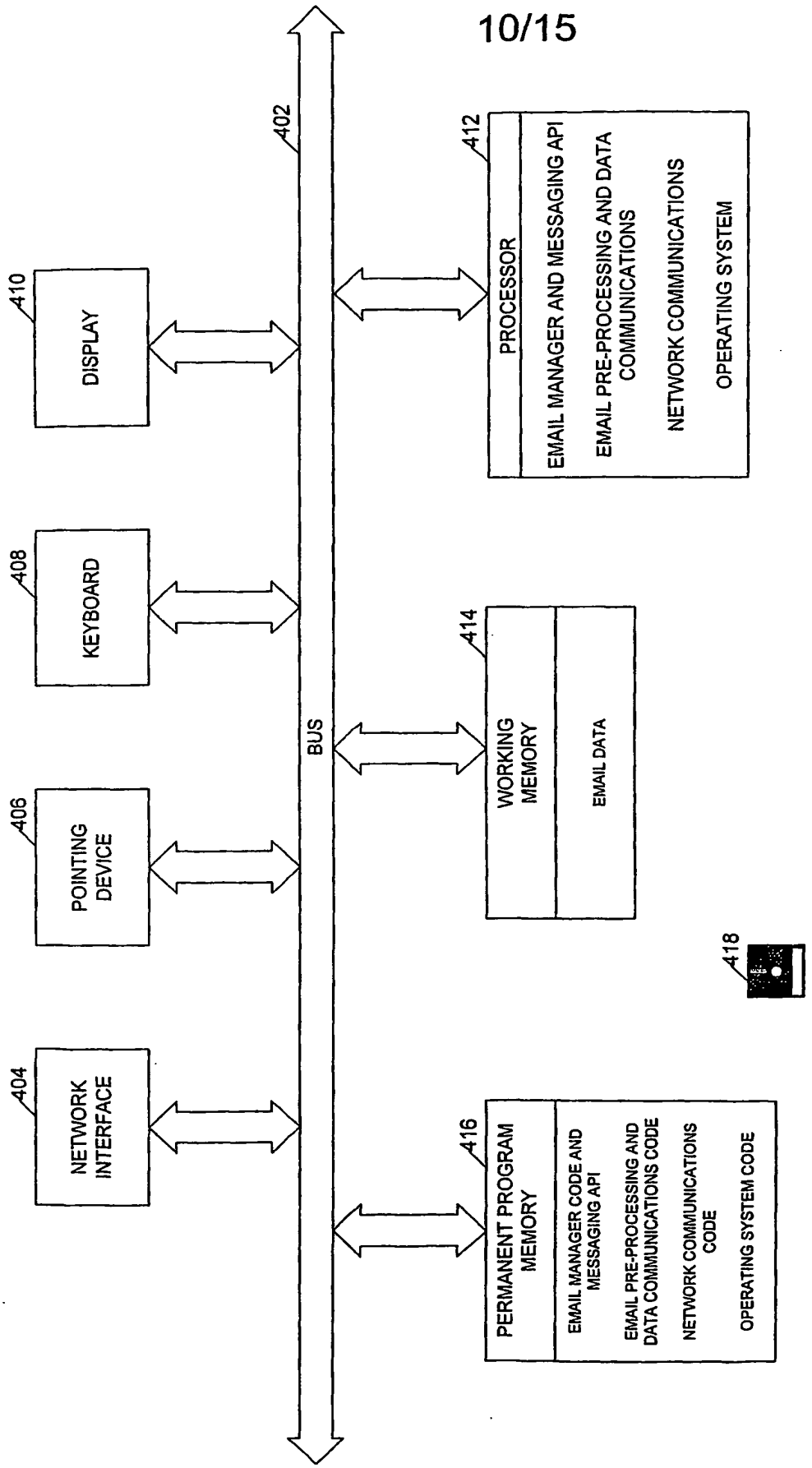

400
BUS
402
DISPLAY
410
KEYBOARD
408
POINTING DEVICE
406
NETWORK INTERFACE
404
PROCESSOR
412
EMAIL MANAGER AND MESSAGING API
EMAIL PRE-PROCESSING AND DATA COMMUNICATIONS
NETWORK COMMUNICATIONS
OPERATING SYSTEM
WORKING MEMORY
414
EMAIL DATA
418
PERMANENT PROGRAM MEMORY
416
EMAIL MANAGER CODE AND MESSAGING API
EMAIL PRE-PROCESSING AND DATA COMMUNICATIONS CODE
NETWORK COMMUNICATIONS CODE
OPERATING SYSTEM CODE

Figure 4

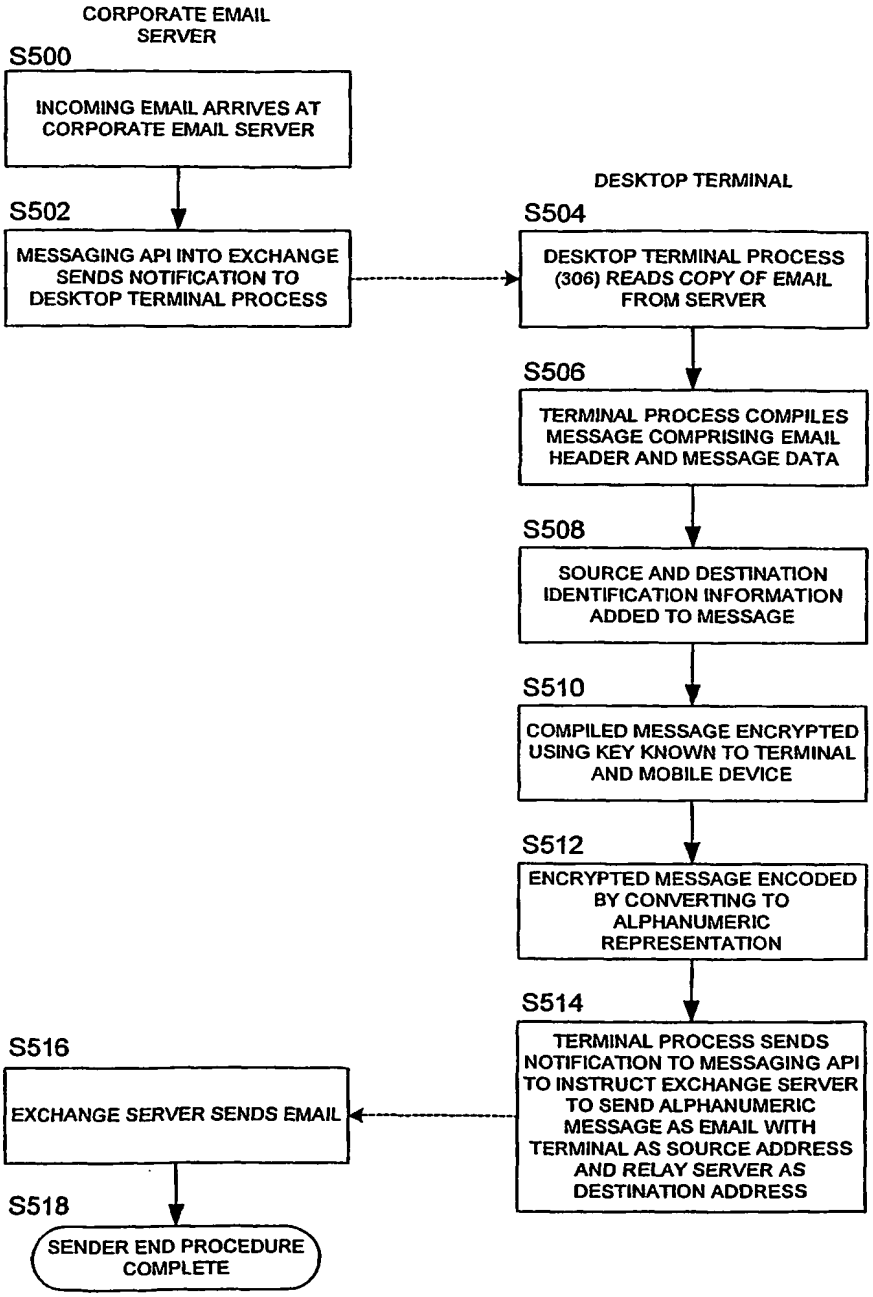

CORPORATE EMAIL SERVER
S500
INCOMING EMAIL ARRIVES AT CORPORATE EMAIL SERVER
S502
MESSAGING API INTO EXCHANGE SENDS NOTIFICATION TO DESKTOP TERMINAL PROCESS
DESKTOP TERMINAL
S504
DESKTOP TERMINAL PROCESS (306) READS COPY OF EMAIL FROM SERVER
S506
TERMINAL PROCESS COMPILES MESSAGE COMPRISING EMAIL HEADER AND MESSAGE DATA
S508
SOURCE AND DESTINATION IDENTIFICATION INFORMATION ADDED TO MESSAGE
S510
COMPILED MESSAGE ENCRYPTED USING KEY KNOWN TO TERMINAL AND MOBILE DEVICE
S512
ENCRYPTED MESSAGE ENCODED BY CONVERTING TO ALPHANUMERIC REPRESENTATION
S514
TERMINAL PROCESS SENDS NOTIFICATION TO MESSAGING API TO INSTRUCT EXCHANGE SERVER TO SEND ALPHANUMERIC MESSAGE AS EMAIL WITH TERMINAL AS SOURCE ADDRESS AND RELAY SERVER AS DESTINATION ADDRESS
S516
EXCHANGE SERVER SENDS EMAIL
S518
SENDER END PROCEDURE COMPLETE

Figure 5

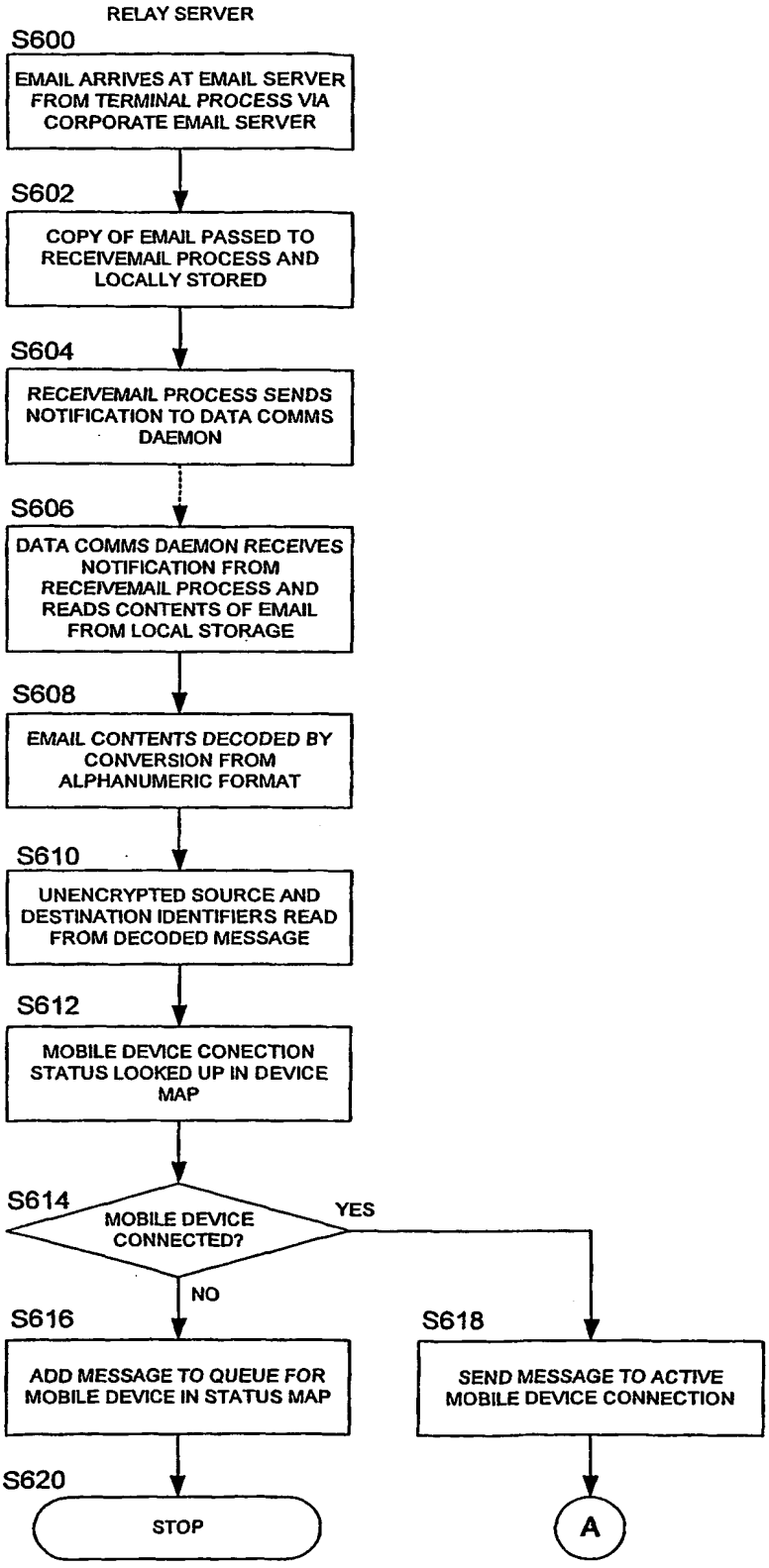

RELAY SERVER
S600
EMAIL ARRIVES AT EMAIL SERVER FROM TERMINAL PROCESS VIA CORPORATE EMAIL SERVER
S602
COPY OF EMAIL PASSED TO RECEIVEMAIL PROCESS AND LOCALLY STORED
S604
RECEIVEMAIL PROCESS SENDS NOTIFICATION TO DATA COMMS DAEMON
S606
DATA COMMS DAEMON RECEIVES NOTIFICATION FROM RECEIVEMAIL PROCESS AND READS CONTENTS OF EMAIL FROM LOCAL STORAGE
S608
EMAIL CONTENTS DECODED BY CONVERSION FROM ALPHANUMERIC FORMAT
S610
UNENCRYPTED SOURCE AND DESTINATION IDENTIFIERS READ FROM DECODED MESSAGE
S612
MOBILE DEVICE CONECTION STATUS LOOKED UP IN DEVICE MAP
S614
MOBILE DEVICE CONNECTED?
YES
NO
S616
ADD MESSAGE TO QUEUE FOR MOBILE DEVICE IN STATUS MAP
S618
SEND MESSAGE TO ACTIVE MOBILE DEVICE CONNECTION
S620
STOP
A

Figure 6a

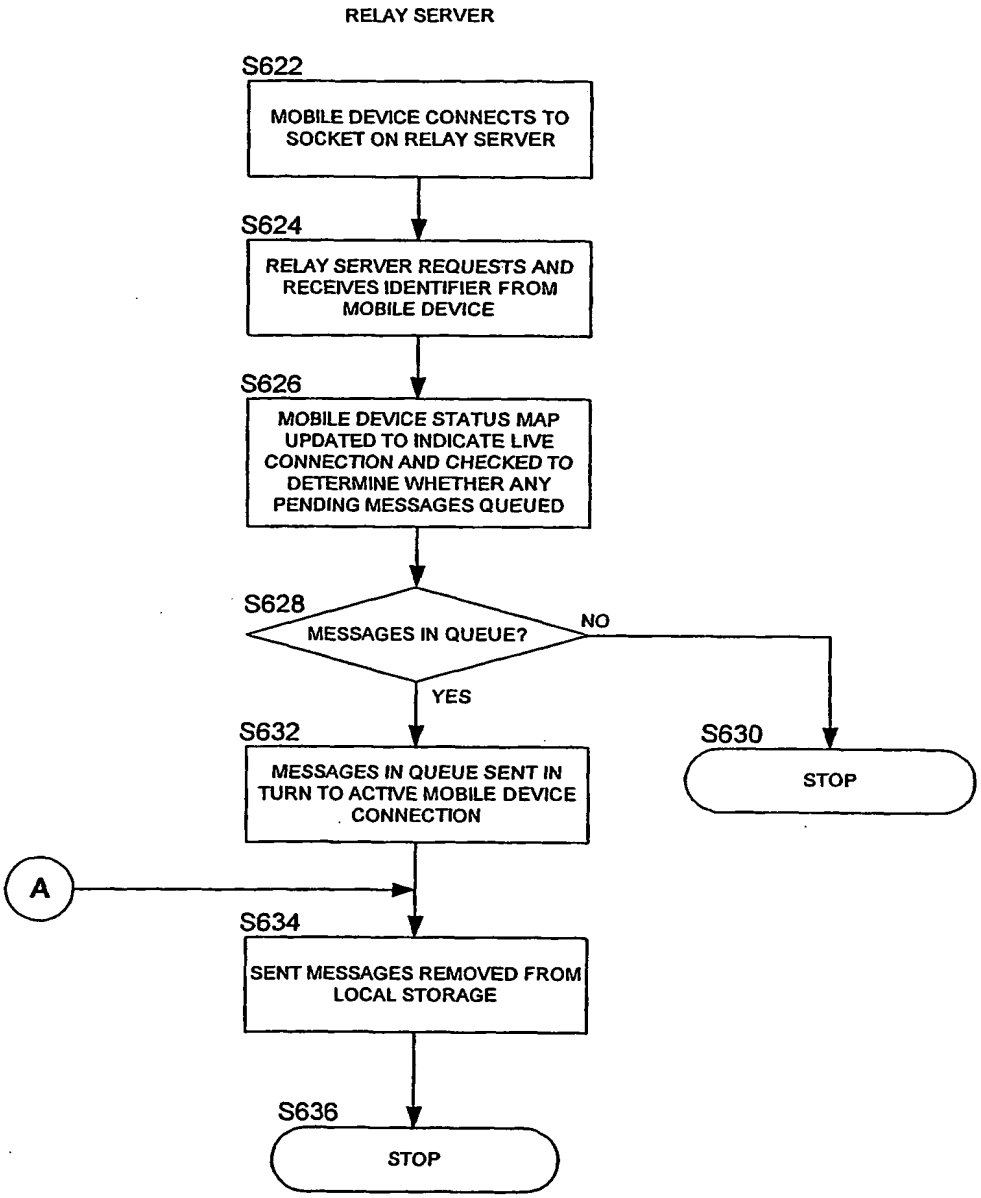

RELAY SERVER
S622
MOBILE DEVICE CONNECTS TO SOCKET ON RELAY SERVER
S624
RELAY SERVER REQUESTS AND RECEIVES IDENTIFIER FROM MOBILE DEVICE
S626
MOBILE DEVICE STATUS MAP UPDATED TO INDICATE LIVE CONNECTION AND CHECKED TO DETERMINE WHETHER ANY PENDING MESSAGES QUEUED
S628
MESSAGES IN QUEUE?
NO
YES
S630
STOP
S632
MESSAGES IN QUEUE SENT IN TURN TO ACTIVE MOBILE DEVICE CONNECTION
A
S634
SENT MESSAGES REMOVED FROM LOCAL STORAGE
S636
STOP

Figure 6b

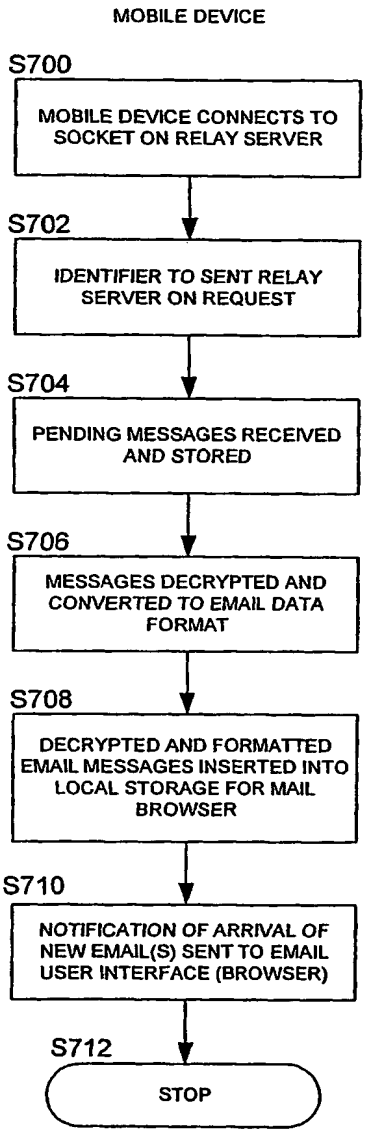

MOBILE DEVICE
S700
MOBILE DEVICE CONNECTS TO SOCKET ON RELAY SERVER
S702
IDENTIFIER TO SENT RELAY SERVER ON REQUEST
S704
PENDING MESSAGES RECEIVED AND STORED
S706
MESSAGES DECRYPTED AND CONVERTED TO EMAIL DATA FORMAT
S708
DECRYPTED AND FORMATTED EMAIL MESSAGES INSERTED INTO LOCAL STORAGE FOR MAIL BROWSER
S710
NOTIFICATION OF ARRIVAL OF NEW EMAIL(S) SENT TO EMAIL USER INTERFACE (BROWSER)
S712
STOP

Figure 7

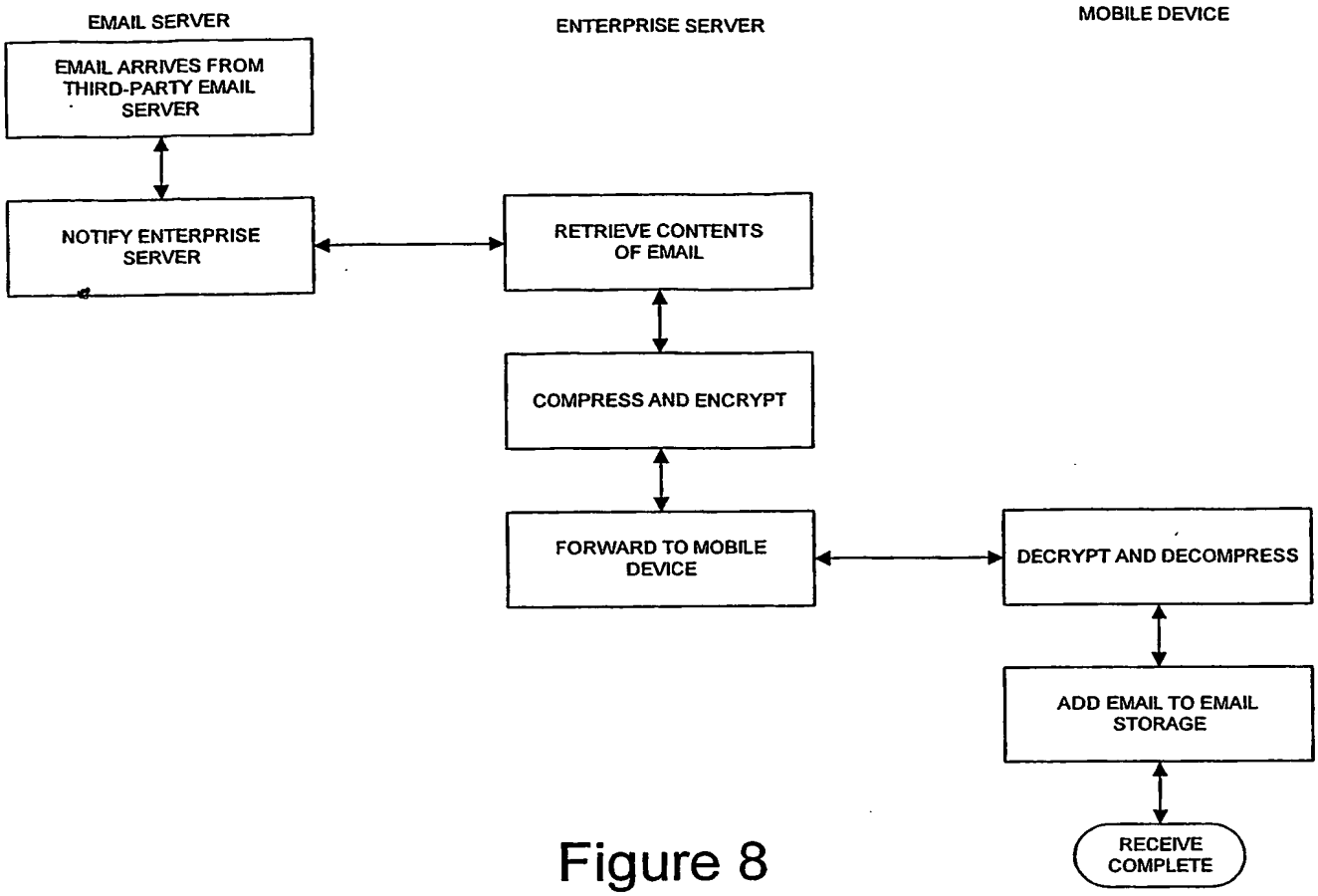


Figure 8

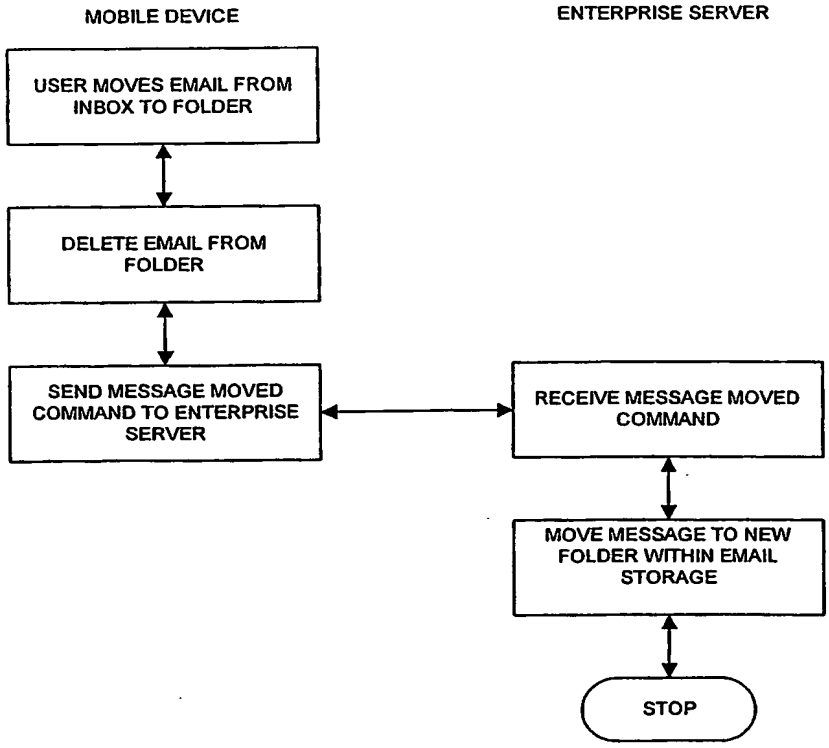


Figure 9